



## Seasonal primary amebic meningoencephalitis (PAM) in the south: Summertime is PAM time

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### Abstract:

Primary amebic meningoencephalitis (PAM), a typically fatal, free-living amebic infection of the central nervous system (CNS), is caused by the thermophilic, freshwater protozoan, *Naegleria fowleri*. More than 145 cases of PAM have been reported worldwide, with most reported cases in the United States (US). Since annual PAM case clusters in the US and worldwide have demonstrated recent increases over background cases, the objectives of this investigation included (1) an epidemiological and statistical analysis of a 2007 cluster of six PAM cases in the southern US, nested in a retrospective review of 121 confirmed US cases of PAM over the period, 1937 to 2007; and (2) a statistical analysis of all existing demographic, temporal, and behavioral risk factors for PAM. Significant risk factors for PAM in the United States included male sex and warm recreational freshwater exposures in seasonal patterns (July - August) in southern tier states, including Louisiana. Although there have been a few recent survivors of PAM treated with combinations of intensive critical care, antifungals, and synergistic antibiotics, case fatality rates for PAM remain very high. PAM is best prevented by combinations of public health educational and behavioral modification strategies. Further investigations will be required to determine the significance of freshwater wakeboarding as a significant risk factor for PAM and to determine any dose-response effects of global warming on rising freshwater temperatures and the growth of aquatic *Naegleria fowleri*.

### Resource Description

#### Communication:

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

#### Communication Audience:

audience to whom the resource is directed

Public

#### Exposure :

weather or climate related pathway by which climate change affects health

Food/Water Quality

# Climate Change and Human Health Literature Portal

**Food/Water Quality:** Pathogen

**Geographic Feature:** 

resource focuses on specific type of geography

Freshwater

**Geographic Location:** 

resource focuses on specific location

United States

**Health Impact:** 

specification of health effect or disease related to climate change exposure

Infectious Disease

**Infectious Disease:** Foodborne/Waterborne Disease

**Foodborne/Waterborne Disease (other):** primary amebic meningoencephalitis (PAM) caused by *Naegleria fowleri*

**Intervention:** 

strategy to prepare for or reduce the impact of climate change on health

A focus of content

**Mitigation/Adaptation:** 

mitigation or adaptation strategy is a focus of resource

Adaptation

**Resource Type:** 

format or standard characteristic of resource

Review

**Timescale:** 

time period studied

Time Scale Unspecified